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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,011	07/07/2005	Takumi Ohara	AK-480XX	2774

207 7590 05/09/2006

WEINGARTEN, SCHURGIN, GAGNEBIN & LEBOVICI LLP
TEN POST OFFICE SQUARE
BOSTON, MA 02109

EXAMINER	
CORDRAY, DENNIS R	

ART UNIT	PAPER NUMBER
1731	

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/517,011	OHARA ET AL.	
	Examiner	Art Unit	
	Dennis Cordray	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/7/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

The abstract of the disclosure is objected to because the first line contains the word "p," which is clearly a typing error.

The disclosure is objected to because of the following informalities: On p 10, line 23, the word "auxilialy" should be changed to "auxiliary." On p 18, line 9, the word "dimmers" should be changed to "dimmers.".

Appropriate correction is required. See MPEP § 608.01(b).

Claims 4-6, 11-22 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 4, 5 and 18-20 recite that, in General Formulae 4-6, X_3^- to X_{10}^- represent an anion. The claims depend from Claims 1, 2 or 4 and ultimately from Claim 1, which recites a polyalkyleneimine in the sulfate salt form. Allowing X_3^- to X_{10}^- to represent an ion embodies species outside of those claimed in Claim 1. Claims 6, 11-17 and 21-22 depend from Claims 4, 5 and 18-20 or reference the structures therein, thus inherit the improper dependent form.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-3, 9-10 and 32-35 recite "if necessary together with a necessary amount of a water-soluble inorganic salt." The Specification refers numerous times to the addition of a water-soluble inorganic salt but does not describe the conditions where it would be necessary to add the salt thus failing to provide one of ordinary skill in the art with guidance as to when the salt needs be used. It will be assumed for the purpose of this examination that addition of a water-soluble inorganic salt is optional.

Claims 5, 19 and 20 recite "reaction product from a polyalkyleneimine or a mixture of a polyalkyleneimine and a polyamine and a polycationic substance." It is not clear whether choices for the reactants include:

- a polyalkyleneimine alone,
- a polyalkyleneimine and a polyamine and a polycationic substance,
- a polyalkyleneimine and a polycationic substance
- a mixture of a polyalkyleneimine and a polyamine and a polycationic substance,
- or some other combination of reactants.

Claims 11-15 recite "paper stuff." It is not clear what the paper stuff includes. The Specification refers to both "paper making raw material" and "paper stuff" on pp 9-10 in a discussion of the claims. It will be assumed for the purpose of this examination that "paper stuff" and "paper making raw material" are the same.

Claims 3 and 32-35 recite the limitation "the water soluble polymer having at least one type of ionicity selected from among said anionicity and said nonionicity" in Claims 1, 20, 22, 26 and 31 respectively. Claims 20, 22, 26 and 31 depend ultimately from Claim 1, which recites "the water soluble polymer having at least one type of ionicity selected from among cationicity, an amphotericity, a nonionicity and an anionicity." There is insufficient antecedent basis for this limitation in the claim.

The remaining claims depend from and thus inherit the indefiniteness of the rejected claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

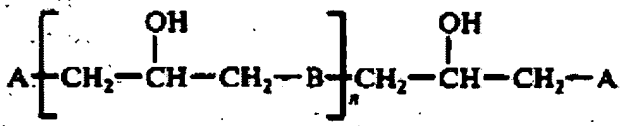
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4, 7-8, 11-14, 16, 18, 23, 27 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buckman et al (4250269) in view of Buckman et al (4054542) and further in view of Shing et al (6217778).

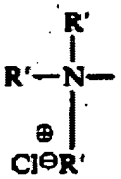
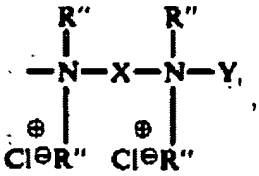
Buckman et al ('269) discloses the use of water soluble polymer mixtures added to the pulps in papermaking processes or in the treatment of wastes and wastewaters (Abstract; col 1, lines 7-28). The polymer mixtures comprise 1 to 10 parts by weight of a quaternary ammonium polymer, 0.5 to 7 parts by weight of a nonionic or cationic vinyl addition polymer and a surfactant. Thus the disclosed polymer composition significantly overlaps the claimed composition.

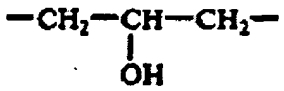
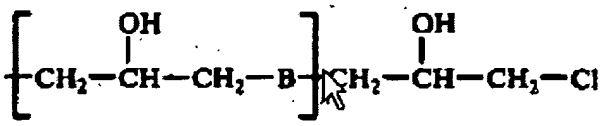
The vinyl addition polymer can be a homo- or co-polymer of ethylinically unsaturated mono-, di- or trialkyl ammonium salts. Preferred are polymers containing a plurality of aminoalkyl nitrogen-substituted acrylamide monomersmers wherein the aminoalkyl substituent contains less than about 8 carbons. Examples are also given of aminoethyl acrylate hydrochloride, N-methylamino ethylacrylate, N,N-dimethylaminoethyl methacrylate (col 4,lines 12-27). The disclosed monomers are embodied by general formulae 1 and 2 of the instant invention.

The quaternary ammonium polymer can be the polymers disclosed in Buckman et al ('542). Buckman et al ('542) discloses a polymer of the structure (col 2, line 12 to col 3, line 4)



where n is an integer, B is a quaternary nitrogen,  ,

A can be  or  ,

X can be  , Y is  .

In the above formulae, R can be an alkyl group of 1-20 carbon atoms, an alkyl group of 1-6 carbons containing one or more hydroxyl groups, or a benzyl group; R' can be an alkyl group of 1-20 carbon atoms, an alkyl group of 1-6 carbons containing one or more hydroxyl groups, or an aryl group; R" can be a straight chain alkyl group containing 1-6 carbons. If one of the A groups is the left hand group above, the structure is the claimed structure of general formula (5) of the instant invention; if both A groups are the right hand group, the structure is the claimed structure of general formula (4) of the instant invention.

While Buckman et al ('542) discloses chloride as the anion, other conjugate bases of an acid, such as sulfate, are well known counter-ions used in quaternary polymers (if evidence is needed, see Pudney et al (5912306, col 2, lines 20-28; col 6, lines 15-45).

Buckman et al ('269) discloses that the mixtures of polymers are used in papermaking in sizing, to improve drainage, to provide retention of fiber fines, dyes, pigments, fillers, starch, and gum, and to increase strength. The polymers are useful in dewatering sewage sludge (col 1, lines 7-14; col 5, lines 33-36; col 6, lines 25-34). The polymer mixtures can be used as sizing agents. Examples are given of uses in drainage, retention, enhancement of freeness and flocculation (cols 10-12, Examples 12-15). Buckman et al ('269) also discloses that polyethyleneimines are well known for the above uses (col 1, lines 29-41).

Buckman et al ('269) discloses that the mixtures of polymers can be made by supplying the polymers as particulate solids (col 5, lines 8-9).

Buckman et al ('269) and Buckman et al ('542) do not disclose the particle size of the water soluble cationic or nonionic polymer.

Dispersion polymerization in a salt solution is a well known polymerization method for vinyllic monomers as evidenced by Shing et al (col 5, lines 8-25; col 6, lines 60-64). The particle size obtained is up to 10 microns (col 5, lines 23-25).

The art of Buckman et al ('269), Buckman et al ('542), Shing et al and the instant invention are analogous as pertaining to polymers used for dewatering papermaking and waste water suspensions. It would have been obvious to one skilled in the art at the time of the invention to use the claimed cationic polymeric particles in the process of making the paper of Buckman et al ('269) in view of Buckman et al ('542) and further in view of Shing et al to further enhance drainage and retention. It would also have been obvious to use sulfate as the counterion as a well known and functionally equivalent anion.

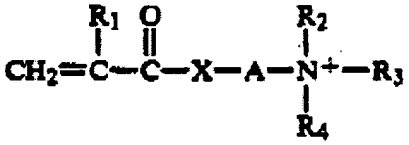
Claims 3, 11-17, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buckman et al ('269), Buckman et al ('542) and Shing et al as discussed above and further in view of Honig et al (5274055).

Buckman et al ('269), Buckman et al ('542) and Shing et al do not disclose that the vinyl addition polymers can be anionic.

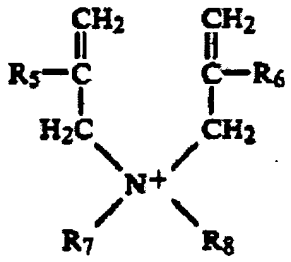
Honig et al discloses numerous examples of prior art wherein one or more cationic or anionic polymers and anionic particles (polymeric or inorganic) having sizes from 1 to 1000 nm are used together to improve drainage, formation or retention in

papermaking systems (cols 1-2). Thus, the use of various combinations of polymers and particles is well known in the art.

Honig et al discloses the use of charged organic polymer microbeads of less than 1000 nm (1 micrometer) in diameter to provide improved drainage and retention in papermaking processes (Abstract). The microbeads are added to a conventional papermaking stock with other common papermaking additives, such as fillers and sizes (col 4, lines 15-37). The microbeads can comprise cationic, nonionic and/or anionic monomers. Nonionic monomers can be present in an amount of 1 to 100% and anionic or cationic monomers can be present in an amount of 0 to 99% of the weight of the bead (col 6, lines 15-25). Cationic monomers include monomers of the formula



where R_1 is H or methyl, R_2 is H or lower alkyl of C_1 to C_4, R_3 and R_4 are H, aryl (i.e.-benzyl) or hydroxyethyl, X is O or NR_1 and A is a C_1-C_{12} alkylene group. The above structure significantly overlaps general formula (1) of the instant invention. Other cationic monomers include diallyldimethylammonium halides or monomers of the formula



where R_5 and R_6 are H or methyl, R_7 and R_8 can be alkyl, benzyl or hydeoxyethyl (col 5, lines 29-62), which formula significantly overlaps general formula (2) of the instant invention.

Anionic monomers include (meth)acrylic acid and salts thereof, which significantly overlaps general formula (3) of the instant invention (col 5, line 67 to col 6, line 5).

The art of Buckman et al ('269), Buckman et al ('542), Shing et al, Honig et al and the instant invention are analogous as pertaining to polymers used for dewatering papermaking and waste water suspensions. It would have been obvious to one skilled in the art at the time of the invention to use the claimed cationic, nonionic or anionic polymeric particles in the process of making the paper of Buckman et al ('269) in view of Buckman et al ('542) and further in view of Shing et al and Honig et al to further enhance drainage and retention.

Claims 5, 6, 19-22, 25-26 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buckman et al ('269), Buckman et al ('542) and Shing et al as discussed above and further in view of Honig et al and Pudney et al (5912306).

Buckman et al ('269), Buckman et al ('542), Shing et al and Honig et al do not disclose crosslinking the polyalkyleneimines with products made by reacting epihalohydrin with ammonia or aliphatic amines.

Pudney et al teaches that the reaction product of bis-tert-amine or a secondary amine with epichlorohydrin, which is the same as the reaction used to prepare general

formulas (6) and (7) of the instant invention, results in a crosslinking agent used with amine containing polymers (col 2, lines 53-57). Pudney et al also teaches that polyethyleneimine and derivatives of polyethyleneimine are well known as drainage and retention aids in papermaking and that it is well known to crosslink polyamines used for drainage and retention aids (col 2, lines 45-52).

The art of Buckman et al ('269), Buckman et al ('542), Shing et al, Pudney et al, and the instant invention are analogous as pertaining to polyalkyleneimines used for drainage and retention aids in papermaking. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the reaction product of bis-tert-amine or a secondary amine with epichlorohydrin to crosslink the polymer of Buckman et al ('269) in view of Buckman et al ('542) and further in view of Shing et al, Honig et al and Pudney et al as a well-known and functionally equivalent reaction.

Allowable Subject Matter

Claims 9-10 and 32-35 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Dispersion polymerization in a salt solution is a well known polymerization method for vinyllic monomers as disclosed by Shing et al (col 5, lines 8-25; col 6, lines 60-64). The particle size obtained is up to 10 microns (col 5, lines 23-25). The use of a dispersant in the polymerization process would be obvious to one skilled in the art. Alkoxylated polyethyleneimines are known dispersants that are also crosslinkable (see Cleary et al, 6127331, Abstract or Ward, 5760386, col 4, lines 13-26) and a person

skilled in the art might be motivated to use an alkoxylated polyethyleneimine in the polymerization process of the instant invention. However, the modified polyalkyleneimines in the sulfate salt form as claimed are quite different from alkoxylated polyethyleneimines and would not be obvious to try as a dispersant with the expectation of similar results.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2, 4-7, 11-12 and 14 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 7, 12-13 and 15-16 of copending Application No. 10/486379 in view of Pudney et al (5912306). The claims of the copending application recite modified polyalkyleneimines

having the same structure as that of the instant claims. The polyalkyleneimines are added to papermaking stock in combination with a water-soluble cationic, amphoteric or anionic polymer having a structure identical to the claimed structure to improve freeness and yield. The anions of the modified polyalkyleneimines are not specified; however, the use of sulfate anions is known in quaternary ammonium compounds as disclosed by Pudney et al (col 2, lines 20-28, col 6, lines 15-45) and it would have been obvious to one skilled in the art to use a sulfate ion at the time of the invention as a functionally equivalent ion.

This is a provisional obviousness-type double patenting rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure [Matter et al (3632559), Lobach et al (4250112), Grollier et al (5009880)]. They pertain to other uses of modified polyalkyleneimines that are similar to the claimed polymers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

STEVEN P. GRIFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

DRC